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AUTHOR Cooper, Erica; Allen, Mike
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ABSTRACT

A quantitative summary of 15 studies indicated that African-American/Latino students receive more negative feedback from teachers in the classroom than do Euro-American students. In addition, teachers interact less frequently with African-American/Latino students than Euro-American students. No difference based on race existed in the amount of positive feedback provided by teachers. Results indicated a potential source of differential treatment in the classroom by instructors that may impact student achievement. (Contains 2 tables of data and 49 references.) (Author/NKA)

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A META-ANALYTIC EXAMINATION OF STUDENT RACE ON CLASSROOM INTERACTION

by

Erica Cooper
Department of Communication
Indiana University
Bloomington, IN 47903

Mike Allen
Department of Communication
University of Wisconsin-Milwaukee
Milwaukee, WI 53201
(414) 229-4261
mikealle@csd.uwm.edu

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ABSTRACT

A META-ANALYTIC EXAMINATION OF STUDENT RACE CLASSROOM INTERACTION

A quantitative summary of 15 studies indicates that African-American/Latino students receive more negative feedback from teachers in the classroom than Euro-American students. In addition, teachers interact less frequently with African-American/Latino students than Euro-American students in the classroom. No difference based on race existed in the amount of positive feedback provided by teachers. The results indicate a potential source of differential treatment in the classroom by instructors that may impact on student achievement.

Some issues of classroom interaction between student and teacher examine whether demographic characteristics (race, gender, socioeconomic status, etc.,) impact on the quality or quantity of those exchanges. A principle concern is whether such variables contribute to inequitable treatment of students. This examination of the classroom views the setting as a source of dyadic interaction between persons of differing power (teacher-student) engaged in an ongoing dialog to accomplish a purpose.

The potential for racial inequity does not require a conscious bias on the part of the instructor. Distinctions on the basis of student features may occur without a conscious recognition of the cause or effect of the variation in interaction among students. Whether the interaction patterns are the same for various students or differ based on the race of the student/instructor constitute an important issue in understanding classroom interaction.

CLASSROOMS, EDUCATION, AND RACE

Educational opportunity is not equally available or effective for all American citizens. A number of investigations over twenty years ago established that educational opportunity varies based on race (United States Commission on Civil Rights, 1971a, 1971b, 1972a, 1972b, 1974). Continued examination since the 1970s has not spawned a sense of optimism in the ability of the educational system to narrow the gap in outcomes (Altbach & Lomotey, 1991; Herrnstein & Murray, 1994). One aspect of research examines the day to day classroom interaction of students and teachers and assesses whether equitable treatment of students by instructors exists.

The assumption of most classroom studies is that some aspect in the quality of education comes from the quality of instruction. The importance of the teacher in the classroom cannot be overstated. The instructor, particularly in the primary grades, is responsible for instruction and the regulation of social behavior. Rewards and punishments come in the form of verbal praise and criticism of students and their performance. The basic premise of most educational practice comes from a sense of positive and negative reinforcement based on the evaluation of performance from the teacher. Teachers provide a constant source of feedback on performance and regulate the climate of the classroom environment.

Communication researchers over the years have examined many issues relating to classroom communication. Current issues regarding the impact of an instructor include: (a) the relationship of affect or emotion with the learning of the student (Rodriguez, Plax, & Kearney, 1996; Teven & McCroskey, 1997) (b) the effect of teacher immediacy (Christophel & Gorham, 1995; McCroskey, Richmond, Sallinen, Fayer, & Barraclough, 1995), and (c) the desire by instructors to alter behavior in the classroom (Kearney & Plax, 1987, 1997; Plax, Kearney, & Tucker, 1986; Waltman & Burleson, 1997). All of these investigations contribute to an understanding of the importance of teacher/student interaction.

Teacher interaction with students can reflect the expectations that the teacher has about the success of the student (Gay, 1975), the social class of the student (Friedman, 1976), or gender of the student (Good, Sykes, & Brophy, 1973, Jones, 1989). One important aspect of classroom interaction is how the treatment of a student by

an instructor communicates a sense of the expectation by the instructor about how the student will perform. The issues surrounding the expectations that educators have about students and the impact of those expectations on subsequent performance are important elements in the process of education.

Rosenthal and Jacobson (1968) examined this effect of expectations, the so-called "Pygmalion" effect. Rosenthal and Jacobson conclude that a teacher's expectation of performance leads to the kind of behavior that an instructor exhibits toward that student. The teacher expects the student to fail and therefore the interaction with that student is based on that premise. The question about how socioeconomic factors play a role translates in to a series of research questions reflected in agendas raised by others (see Sprague, 1992 for an outline of this for communication education research).

The publication of Herrnstein and Murray's book, *The Bell Curve* (1994) creates the pressure for a self-fulfilling prophecy based on race. The teacher expects that the minority (Native American, African American, Latino) student to fail, while the majority (Euro-American) or gifted (Asian-American) student will succeed. The classroom interaction and the subsequent praise and criticism from the teacher reflects that initial premise. The publication of arguments about differential racial ability serves as the basis for treatment that creates that very outcome.

Race reflects one set of markers toward students that instructors have available. Race (as well as gender or any other characteristic) ought to provide the instructor with information

about the student. This information forms the basis for expectations that become reflected in how behavior by the student becomes interpreted by the instructor. The same behavior if exhibited by different students may create divergent reactions by an instructor depending on the expectations of the educator for that student. Not only is the behavior evaluated by the instructor but that student behavior is compared to the sense of expectations that the instructor has for that student.

Teachers may interact with different frequency based on the group membership (race) of the student. This difference in the access to feedback or the accessibility of the instructor generates differences in the quality of instruction. A teacher interacting less with a student has less information about the student's performance, knowledge, and skill. Interaction not only serves the purpose of answering and improving instruction for the student but frequent interaction provides information to the instructor about the progress of the student. Reduced levels of interaction with a student means less information about the progress of the student and therefore hinders the ability for improvement. This lack of interaction might be reflected in reduced levels of immediacy and less learning (for research in the college classroom, see Neuliep, 1995).

JUSTIFICATION FOR THE USE OF META-ANALYSIS

Meta-analysis provides a superior method of integrating and assessing quantitative investigations than qualitative literature reviews, particularly when the number of studies is large (Preiss & Allen, 1995). Even for smaller numbers of studies, the systematic

nature of the synthesis and the use of comprehensive examinations of the literature make the technique desirable.

One advantage of meta-analysis is the impact of systematic examination of the features and issues surrounding the analysis (Hunter & Schmidt, 1990). The goal of a meta-analysis should be the use of explicit and replicable methods. The advantage of a meta-analytic summary is that any other scholar can replicate, challenge, or explore the findings of a meta-analysis. In addition, as additional data become available, the results of any future investigation can be compared to the findings of the meta-analysis to examine the context within which to interpret any subsequent study (Preiss & Allen, 1995).

One strength of meta-analysis is the systematic examination of contextual, methodological, and theoretical domains of the literature (Hale & Dillard, 1991). A meta-analysis can point to any areas of research lacking sufficient data, in addition, the results of the investigation can point to the need to conduct additional research to explore unexplained or other sources of inconsistency.

METHODS

Literature Search

A search of the relevant literature was conducted within relevant data bases (ERIC, PSYCLIT, COMINDEX, SCA INDEX TO COMMUNICATION JOURNALS) using key words (and combination of key words) suggested by the Thesaurus of the data base (classroom interaction, race, student-teacher interaction).

For inclusion in this quantitative literature synthesis an investigation had to possess the following characteristics:

(a) Involve the use of race or ethnic classifications of students;

(b) Use some type of dependent measure that coded actual teacher interaction with students or used the evaluation of the classroom statements of students by instructors;

(c) Investigation had to employ quantitative measures of interaction (qualitative data cannot be included in a meta-analysis).

Various studies were reviewed and not included in this examination of the literature for a variety of reasons Some studies dealt with socioeconomic class but not race (Friedman, 1976), used that ratings of principles for interaction effectiveness (Israel, 1967), examined the attitudes of teachers towards desegregated ve us segregated classrooms (Brown, Payne, Lankewich, Cornell, 1 , examined expectations unrelated to race (Jeter, 1972).

Coding of Study Features

Various aspects of the design or nature of the empirical investigations might create the possibility of moderator variable. The impact of a moderator variable is that some studies will observe different effects for different levels or aspects of the moderating variable.

Type of Interaction/Evaluation Measure

The studies used a variety of measures to assess the impact of race on the issues of behavior within the classroom. The measures applied to a variety of types of methods of measuring the impact of race on classroom interaction.

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The types of interactional assessments that could be made were coded as: (a) negative, (b) positive, (c) quantity. Negative interaction codes deal with teacher interactions involving criticism, ignoring the student, or in some other way providing feedback to the student that was nonsupportive. The coding does not reflect whether, for example, the student gave a wrong answer to a question but rather the nature of the interaction or feedback to the student.

Positive feedback indicates the affirming or other behavior that provides a desirable reinforcement to the student. Recognizing a student, providing feedback that an answer is correct, that a question is a good question, all of these constitute examples of positive feedback to a student.

Quantity simply provides an estimate of the frequency of the interaction. These measures simply describe the quantity of interaction that an instructor has with a particular student. This measure is some estimate of the frequency of interaction.

Statistical Analysis

The statistical procedure used in this meta-analysis requires a series of steps. First each effect must be extracted from the available investigations and converted to a common metric. In this case the common metric used is the correlation coefficient. The method of meta-analysis used is that developed by Hunter and Schmidt (1990) and involves the use of a variance-centered form of meta-analysis.

The second step is the averaging process across information generated by separate investigations. The average is generated by

weighting each estimate of the effect by the size of the sample. Theoretically, the accuracy of the estimates provided by each individual investigation relates to the size the sample for that study. Failing to weight the estimate by sample size treats studies with small sample sizes as equal with studies with large sample sizes, and the confidence interval for each effect is different (larger studies are more accurate due to less sampling error).

The last quality assessed is the homogeneity of the average estimate. The sample of estimates individually differ based on sampling error. Sampling error is the effect of random differences between studies. The homogeneity test considers what amount of variability should exist theoretically due to sampling error given the number of estimates, the sampling size, and the size of the average effect. This estimate of the variation that is expected can be compared to the actual extent of variation existing in the data.

The comparison provides a basis to evaluate the possible existence of moderator variables. If the level of variability is small then the existence of moderator variables is unlikely. An average effect that is homogeneous provides an average that represents the entire set of effects that vary only as a function of random sampling error. Should the chi-square be significant, that would indicate more variability than expected due to random chance. This heterogeneity of effects indicates the probable existence of moderator variables.

A successful finding of a moderator variable mirrors the assumptions of analysis of variance which assumes that a significant

differences exists between conditions but that homogeneity of variance exists within cells.

RESULTS

Overall

The overall analysis indicates that minority students on average participate in less classroom interaction than Euro-American students (average r = -.091, k=15, N=1695, var. = .0228). This finding however was based on a heterogeneous sample of correlations ($X^2_{(14)}$= 39.29, p < .05). This significant chi-square indicates that the average effect is based on samples that probably have at least one moderator variable present. The inspection of the effects (listed in Table 1) indicates that the Feldman and Donohue (1978) studies had extremely large effects. Those two studies were the only studies to rely strictly on an analysis of nonverbal behavior between students and teachers. The only other study to consider nonverbal behavior (Simpson & Erickson, 1983) combined the estimates with verbal behavior.

Deletion of this manuscript (which conducted two separate studies) and a reanalysis indicate similar mean differences (average r = -.070, k=13, N=1647, var. = .0078). The impact of deleting these two studies creates a homogeneous sample ($X^2_{(12)}$= 0.00, p > .05). This average correlation was significantly different from zero (t = 2.85, p < .05). This effect indicates less classroom interaction for minority students.

Type of Interaction Measure

The first type of classroom interaction measure dealt with the use of negative statements by instructors to students. This included criticism of answers, statements intended to regulate behavior, or any statement/interaction that could be construed as negative (e.g., ignoring student questions, responses). The average correlation was positive (average r = .078, k=9, N=1022, var. = .0097). This sample of correlations demonstrated homogeneity ($X^2_{(8)}$= 10.08, p > .05). This average effect indicates the minority students receive significantly more (t = 2.50, p = .01) negative statements from teachers than Euro-American students.

The next set of evaluations considered the use of positive statements made by instructors to students. These statements are interactions where the teacher provides praise, affirmation, or recognition to a student. The average correlation was slightly negative (average r = -.047, k=10, N=1141, var. = .0164), indicating Euro-Americans receive slightly more praise (this was nonsignificant, t = 1.58, p = .11). This finding however was based on a heterogeneous sample of correlations ($X^2_{(9)}$= 18.83, p < .05), indicating the possible existence of a moderator variable. Given the small number of studies no subanalysis was conducted, therefore the average effect for this analysis should be interpreted cautiously.

The last effect considers the total interaction between a teacher and a student of a particular race. The average effect is negative (average r = -.076, k=8, N=1034, var. = .0096) and significant (t= 2.45, p = .04). This finding was based on a

homogeneous sample of correlations ($X^2_{(7)} = 9.99$, $p < .05$). This last finding indicates that the minority student interacts with a teacher less than a Euro-American student.

CONCLUSIONS

The results indicate that the race of the student impacts on the quantity and valence of the interaction. African-American/Latino students participate in smaller amounts of total classroom interaction with instructors but higher levels of negative interaction when compared to European American students. From the standpoint of a reinforcement model of instruction, the teacher is differentially using more negative reinforcement for minority students, while in general interacting slightly less with minority students.

Theoretically, the results indicate issues with regard to the potential success of minority students in the classroom. Students participating in less interaction and receiving more negative statements from an instructor should probably underperform. Given current models of teacher effectiveness based on affective learning style (Rodriquez, Plax, & Kearney, 1996), the differential interaction patterns may reduce the learning of minority students. Some students are receiving more negative feedback and less interaction, those students may develop a negative affect (or a less positive affect) with the instructor and learn less. The reinforcement that the student receives is slightly more negative, worse, the student may perceive a differential exists on the basis of race and react negatively to education based on that.

Meta-analysis, while offering an improvement over narrative or box-score review techniques is not without limitations and the need to qualify findings. The primary limitation of any meta-analysis is whether the current research provides a large and diverse enough set of data to establish stable findings. The current set of data on this issues is very limited. There seems to exist a relative paucity of studies examining the impact of race or ethnicity of the students/instructors on classroom interaction at any level of education. Almost every study or review of this literature laments the small number of primary investigations conducted on this issue.

The data for this kind of investigation are difficult to generate. The technique requires the use of actual interaction, typically from videotape, audiotape or live coding. Then after obtaining the data, trained observers must code each of the interactions. The level of commitment and energy necessary to produce this kind of data requires extensive resources and commitment on the part of the investigators. However, given the importance of the information to the educational process, the expenditure of those resources appears warranted.

The recent decision of the Oakland school district to introduce training in ebonics (the term used to describe "black English") was motivated to train educators to understand the local vernacular to promote the training in Standard English. The argument was the instructors untrained and unfamiliar with the local slang would treat students as part of a foreign culture and unable to interact effectively with students. If students are in a classroom and interacting with an instructor unable to interpret

common statements (at least common to the idiom of the student), then the instructor could be perceived as distant and foreign. The decision to train instructors in the local language features indicates an assumption that the ability of instructors to interact with students is important.

Classroom interaction could be considered from as a setting involving intercultural communication. Hecht, Collier, & Ribeau (1993) argue for the need to consider African American communication from the standpoint of the communicator utilizing a different perspective. This is particularly important when considering issues of how communication conversatonal difficulties and repairs occur between African American and European Americans (Allen, Hecht, & Martin, 1996; Martin, Hecht, & Larkey, 1994). The same issues occur when considering the Latino/a community where interaction assumptions reflect cultural values (Marin & Marin, 1991). The contextualization of the issues as those in intercultural communication provides the basis for consideration of methods of examining possibilities for improving communication.

The results indicate that race plays a factor in the interaction pattern between students and instructors. Instructors according to these findings treat students differentially based on race in the classroom. The desire by school systems and educators to provide remedial training and recognition of these patterns may require some consideration. However, little literature at the current time provides an empirical basis of how any intervention changes the behavior of instructors. Until data on the effectiveness of how intervention changes the behavior of the

instructor, the confidence of the interventions to positively change classroom interaction is undocumented. Without such methods of evaluation, effects at multiculturalism, sensitivity, or diversity may prove empty gestures.

The size of the effects generated may cause a person to dismiss the effect as insignificant and unimportant. One method of readily interpreting the effects observed in this analysis is the binomial effect size display (BESD). This technique was developed by Rosenthal (1984) explicitly to provide a means of interpreting meta-analytic findings. The BESD creates a method of examining the impact of findings when comparing groups for any size effect. See Table 2 for a display of the impact of the average correlation observed in this summary. The BESD exploration provides for a 16% increase/decrease in interaction amount based on race. This number is similarly reflected in the differences in positive and negative interaction patterns and the association based on race.

Another consideration is that the impact of classroom interaction is not from a single episode but rather cumulative as a result of day-to-day interaction spread across at least 12 years. Abelson (1985) points out that the difference in baseball between a .200 hitter and a .300 hitter for a single at bat is .00317 (using omega squared). The objective difference between a .200 hitter and .300 hitter is that the .300 hitter is 50% more likely to successfully hit the ball than the .200 hitter. However, when one examines a single at bat (that is, a small portion of the available data) the effect is reduced to .00317. Consider the studies in this summary, each study takes only a few hours of interaction from the

hundreds and thousands of hours of interaction experienced by each student. Abelson concludes that small effects may have enormous impacts when the messages repeat regularly and the impact of the process can be cumulative over time. What may appear from an analysis as a relatively unimportant effects generated by single studies with very limited time spans, may have enormous consequences when considering the long term impact of this continuous pattern across the educational lifecycle of the student.

The problem of classroom equal treatment poses an interesting dilemma beyond the scope of this report. On the one hand, an emphasis on the diversity of the students requires consideration of differences such as race, gender, sexual preference, and other features of the student population. However, at the same time discrimination and bias on the part of the instructor that favors any group over another should not be condoned. The problem is to articulate those behaviors necessary to increase the effectiveness of the classroom behavior of the instructor by incorporating elements of diversity. At the same time, the differential treatment in the name of diversity must not create the perceptions of unequal treatment of students. The results in this paper provide some additional context in which to discuss the issues of interaction in the classroom.

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Table 1

Information Associated with Each Investigation

Study*	date	Sample Size	Effect for type of interaction:# Negative	Positive	Amount	Average
Aaron	1982	39	.025	.000		-.012
Brown	1969	24	.045	.006	.416	-.012
Byalick	1974	60			-.214	-.214
Feldman I	1978	36				-.860
Feldman II	1978	12				-.656
Gay	1974	96	.075	-.202	-.177	.033
Grant	1985	80	.082	.055	.027	.000
Hart	1990	16			.024	.024
Hillman	1979	306	.057	.000		-.021
Irvine	1985	67	.088	-.029	-.144	-.087
Jackson	1974	430			-.098	-.098
Rubovits	1973	66	.432	-.199		-.277
Simpson	1983	83	.117	.270		.077
Tyo	1972	261	.008	-.065	-.036	-.036
Woodworth	1971	119		-.248		-.248

*author listed is first author, see references for complete citation

#positive effects indicate African-American/Latino students participation in more of that form of classroom interaction

Table 2

Binomial Effect Size Display Interpretation of Findings

	Amount of Teacher/Student Interaction	
	Percentage of students	
	Below Average	Above Average
Race		
African-American/Latino	53.8%	46.2%
Euro-American	46.2%	53.8%

This is based on a correlation of -.076, indicating that African-American/Latino students participate in less student/teacher interaction.

The exhibited difference indicates that 15% more Euro-American students receive above average levels of interaction compared to African-American/Latino students